NASA/CR-97- 205754

JHU PARTICIPATION IN 'MISSION SCIENTIST ON THE EUROPEAN SPACE AGENCY'S INFRARED SPACE OBSERVATORY'

Final report

FINAL
IN-90-CR
OCIT

Grant NAGW-3183 has funded work at the Johns Hopkins University in support of the ISO GTO program 'Measurement of Water Vapor and Oxygen Abundances' (P.I., Martin Harwit). The Principal Investigator for the effort at Johns Hopkins University was Professor David Neufeld.

Prior to the launch of ISO, grant NAGW-3183 supported three activities:

1) Theoretical modeling of the far-infrared water emission expected from shocked interstellar regions;

2) Theoretical modeling of the far-infrared water emission expected from circumstellar outflows from oxygen-rich evolved stars; and

3) Planning of ISO observations to test the predictions obtained in (1) and (2), including the selection of sources, target lines, ISO observing modes, and integration times.

This work was carried out by David Neufeld and graduate students Michael Kaufman and Wesley Chen.

Since the launch of ISO, the grant has supported a fourth activity:

4) Analysis and interpretation of far-infrared water line emissions detected in ISO observations of W Hydrae. These observations, carried out early in the mission during the Performance Verification phase, led to the first detection of thermal water vapor emission from a circumstellar outflow.

The analysis and interpretation of additional ISO observations continues with the support of grant NAG5-3316, which is effectively a continuation of NAGW-3183 for which this is the final report.

The results of activities (1), (2) and (4) have been described in the following papers, reprints of which are enclosed herewith.

"Far-Infrared Water Line Emissions from Circumstellar Outflows", Wesley Chen and David A. Neufeld, ApJ, 453, L99 (1995)